

Remarks

In the final Office Action mailed May 6, 2004:

1. Claim 25 was objected to because of an informality; and
2. Claims 25-31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,844,890 (Delp), in view of U.S. Patent No. 5,732,094 (Petersen).

I. Delp (U.S. Patent No. 5,844,890)

Delp is intended to describe “a method for scheduling cell transmissions that provides proportional use of available network bandwidth” (column 1, lines 22-24). Because Delp is concerned with proportional use of network bandwidth, and does not allow dynamic adjustment of the amount of data a channel can transmit, it cannot make obvious the claimed embodiments of Applicant’s invention.

A. Delp Cannot Send more than a Threshold Amount of Data

Delp schedules data for transmission based on slots in a timing wheel (column 5, lines 62-66). The Examiner stated that Delp teaches placing a limit or weight corresponding to a threshold time that corresponds to a threshold amount of data, wherein the threshold time corresponds to time slots in a timing wheel (first full paragraph of page 3 of the final office action).

It is therefore understood by Applicants that the Examiner is asserting that Delp associates a threshold amount of data with a queue, wherein the threshold data amount is equal to the time period represented by the time slot(s) assigned to the queue, multiplied by the bit rate.

It is therefore impossible for Delp to exceed that threshold amount of data. During each turn or slot, the cell scheduler 102 in Delp can only schedule an amount of data corresponding to the slot assigned to a given queue (i.e., the “threshold amount”), no more.

In a claimed embodiment of Applicant’s invention (e.g., claim 25), more than the threshold amount of data may be scheduled during a memory’s turn. Delp cannot do this.

B. Delp does not Decrease a Threshold Amount of Data when a Previous Amount of Data Scheduled for Transmission Exceeds the Threshold

Delp schedules data for transmission based on slots in a timing wheel (column 5, lines

62-66). The timing wheel slots apparently allow only a fixed amount of data to be scheduled. Therefore, each time a queue is scheduled, it is for a set amount of data. This is logical, as Delp is designed to provide “proportional use of available network bandwidth” (column 5, lines 14-15) for multimedia applications (column 1, lines 28-33), which are characterized by steady streams of data.

The cumulative amount of data being sent for a given queue is apparently controlled by the frequency with which the queue is assigned to a slot (e.g., FIGs. 10-13; column 11, lines 1-27). For example, the invention is described in the context of an ATM cell scheduler (column 5, lines 7-12), which requires fixed size cells (column 1, lines 54-55).

Because Delp uses fixed size time slots, as described in Section I.B, Delp *cannot* schedule more data from a queue than one time slot will accommodate. Consequently, Delp *would not* and *cannot* decrease a threshold amount of data to be scheduled for transmission during a subsequent servicing turn.

In the final office action, the Examiner stated that “by teaching adjusting the allotted time for transmission, Delp teaches adjusting the amount of data scheduled by determining an adjusted allotted time having an established bit rate.” Applicants respectfully disagree and are unsure how Delp is being interpreted as “teaching adjusting the allotted time.” Delp may schedule data for transmission *at* different times (i.e., by using different time slots), but each slot allows the same amount of data to be transmitted, no more.

In particular, Delp services a given queue during its assigned slot, and then schedules a next slot based on appropriate parameters (e.g., column 6, lines 43-53). Delp apparently cannot and does not adjust the size of slots in a timing wheel or the amount of data scheduled for transmission during a slot. No mention of decreasing the size of a slot was located by Applicants.

Even if Delp could be interpreted as altering the *frequency* with which a queue is scheduled, Delp doesn’t do so after determining whether an amount of data scheduled for transmission was greater than a threshold associated with the queue from which the data was scheduled.

C. Delp does not Maintain a Deficit if Too Much Data is Scheduled or Sent

As described above, Delp *cannot* send or schedule more than a threshold amount of data

– the amount associated with one timing slot. Therefore, Delp need not and cannot reduce a subsequent amount of data subsequently sent or scheduled. And, Delp need not and does not maintain a deficit for a queue, to indicate how much more than the threshold was sent or scheduled for a particular queue.

D. Delp Does Not Use Dynamic Weights Associated with Memories for Controlling How Much Data is Scheduled or Sent

In Delp, data cells of a data stream are stored in queues, for which target transmission times are calculated using parameters associated with the stream's logical channel (column 3, lines 31-34). Queues are assigned to appropriate time slots in the timing wheels, to attempt to meet the target transmission times (column 3, lines 34-37). Each slot apparently allows a single transmission from whichever data cell queue is assigned to the slot and is active when the slot becomes the current slot. All slots are apparently equal in the amount of data cells they allow to be scheduled.

A claimed embodiment of Applicant's invention (e.g., claim 25) employs a plurality of memories having *dynamically adjustable* weights corresponding to threshold amounts of data permitted to be scheduled during each memory's turn.

The Examiner cited to column 9, lines 37-54 as teaching this aspect of the Applicant's invention. This section discusses calculating a new timestamp and time slot. Using new timestamps and slots for transmitting data is inherently different from a dynamically adjustable weight that remains associated with a single memory.

II. Petersen (U.S. Patent No. 5,732,094)

A. Petersen does not Maintain a Deficit if Too Much Data is Scheduled or Sent

In an embodiment of the invention (claim 25), a preferred amount of data to be serviced from a memory during one servicing turn is decreased by a deficit created by the amount of data serviced in a previous turn.

Petersen describes padding a frame to expand it to network specifications, thereby *increasing* the amount of data transmitted. If Petersen could be said to employ a "deficit," it is employed in a manner opposite to how a deficit in the present invention.

III. Selected Claims

Claims 25-31

The rejections of claims 25-31 are traversed for the reasons stated above.

Claim 25 has been amended to reflect the use of a deficit from one servicing turn of a memory to decrease the amount of data to be serviced in a following turn. As stated above, neither Delp nor Petersen does this.

Claim 25 was also amended to reflect the ability to retrieve more than a threshold amount of data from a memory. As described above and in replies to previous office actions, Delp does not do this.

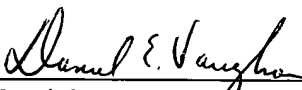
Claim 29 was cancelled and claim 30 was amended to depend from claim 25 vice claim 29.

CONCLUSION

No new matter has been added with the preceding amendments. It is submitted that the application is in condition for allowance. Such action is respectfully requested. If prosecution of this application may be facilitated through a telephone interview, the Examiner is invited to contact Applicant's attorney identified below.

Respectfully submitted,

Date: June 17, 2004

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